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Bacteriological status, antibiotic resistance and metal tolerance patterns of bacteria isolated from macrobrachium rosenbergii water sample rearing tanks / Aiza Shahida Rosman.

PERPUSTAKAAN SULTANAH NUR ZAHIRAH  
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PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

BACTERIOLOGICAL STATUS, ANTIBIOTIC RESISTANCE AND METAL  
TOLERANCE PATTERNS OF BACTERIA ISOLATED FROM *Macrobrachium*  
*rosenbergii* WATER SAMPLE REARING TANKS

By

Aiza Shahida Binti Rosman

Research Report submitted in partial fulfillment  
of the requirements for the degree of Bachelor of  
Agrotechnology Science (Aquaculture)

Department of Fishery Science and Aquaculture  
FACULTY OF AGROTECHNOLOGY AND FOOD SCIENCE  
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**FAKULTI AGROTEKNOLOGI DAN SAINS MAKANAN  
UNIVERSITI MALAYSIA TERENGGANU**

**PENGAKUAN DAN PENGESAHAN LAPORAN  
PROJEK ILMIAH I DAN II**

Adalah ini diakui dan disahkan bahawa laporan ilmiah bertajuk:

... Bacteriological Status, Antibiotic Resistance and Metal Tolerance Patterns of Bacteria  
... Isolated from *Macrobrachium rosenbergii* Water Sample Rearing Tanks .....

oleh..... Aiza Shahida binti Rosman ....., No.Matrik ... UK 16330 ... telah  
diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan  
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sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda  
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## DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledge.

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Date : 28 MAY 2009

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## ABSTRACT

The giant freshwater prawn, *Macrobrachium rosenbergii*, is a commercially important species of crustacean cultured extensively throughout Southeast Asia. A study was undertaken to investigate the present of the bacteria in cultivated *M. rosenbergii* at marine hatchery of University Malaysia Terengganu, Terengganu and to determine the correlation of antibiotic and heavy metal resistance patterns. Total plate count (TPC) were ranged from  $1.6 \times 10^2$  to  $46 \times 10^2$ . The isolate were comprised as *Aeromonas* sp., *Pseudomonas* spp., *E. coli*, *Vibrio* spp., *Salmonella-Shigella* and *Enterobacter* which identified based on morphological typing by using selective agar plating such as Eosin Methylene-blue Lactose Sucrose Agar (EMB), Xylose Lysine Deoxycholate Agar (XLD), MacCONKEY agar, Thiosulfate Citrate Bile Sucrose Agar (TCBS) and Pseudomonas Aeromonas Selective Agar Base (GSP). Antibiotic susceptibility were conducted by using 15 different antibiotics that were commonly used in hatcheries. The study would help developing effective strategies for controlling pathogen in rearing system in hatchery thus useful for reduced the disease that effected *M. rosenbergii*. This study was initiated as a preliminary attempt to establish the normal bacterial counts and aerobic, heterotrophic microflora found in freshwater prawn hatcheries in Malaysia, and their resistance to various antibiotic and heavy metal and thus the correlation their resistant between antibiotic and heavy metal. This information will help in the future assessment of significance of isolates from diseased larvae in epizootic bacterial diseases.



## ABSTRAK

Udang galah, *Macrobrachium rosenbergii* merupakan spesies krustasea yang ditenak secara ekstensif di seluruh Asia Selatan untuk tujuan komersil. Kajian dijalankan untuk mengenalpasti kehadiran bakteria di dalam ternakan udang galah *M. rosenbergii* yang dijalankan di hatcheri air masin yang terdapat di Universiti Malaysia Terengganu, Terengganu serta untuk menentukan terdapat hubungan di antara antibiotic dan daya ketahanan kepada bahan kimia berat. Total plate count (TPC) ialah berukuran dari  $1.6 \times 10^2$  sehingga  $46 \times 10^2$ . Pemencilan adalah terdiri daripada *Aeromonas* sp, *Pseudomonas* spp., *E. coli*, *Vibrio* spp., *Salmonella-Shigella* dan *Enterobacter* yang telah dikenalpasti berdasarkan kepada morfologi dengan menggunakan Eosin Methylene-blue Lactose Sucrose Agar (EMB), Xylose Lysine Deoxycholate Agar (XLD), MacCONKEY agar, Thiosulfate Citrate Bile Sucrose Agar (TCBS) dan Pseudomonas Aeromonas Selective Agar Base (GSP). Ujian kerintangan terhadap antibiotik dijalankan dengan menggunakan 15 jenis antibiotik berbeza yang biasa digunakan di hatcheri. Kajian ini boleh membantu dalam pembangunan strategi yang efektif untuk pengawalan patogen bagi sistem penjagaan di hatcheri, disamping berguna untuk tujuan pengurangan penyakit yang menjangkiti *M. rosenbergii*. Kajian ini merupakan pencetus kepada permulaan untuk membangunkan pengenalpastian bacteria normal dan aerobic, mikroflora heterotrofik yang dijumpai dalam hatcheri udang galah air tawar di Malaysia, dan ketahanan mereka terhadap pelbagai jenis antibiotic dan logam berat, dan seterusnya hubungan di antara daya ketahanan antibiotic dan logam berat. Pengetahuan ini dapat membantu kepada penilaian masa depan terhadap kepentingan pemencilan daripada larva yang mempunyai penyakit epizootik bakteria.